

## SEQUENCE LISTING

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<110> DALE, JAMES LANGHAM
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His Lys Pro Leu Thr Ala Gln Glu Val Gln Thr Leu Ala Gln Ser Leu 100 105 110

Ile Lys Glu Pro Lys Gln Ile Glu Gln Gln Ala Val Phe Leu Lys 115 120 125

Glu Leu Lys Glu Gln Thr Ala Lys Ile Gln Ala Leu Leu His Glu Leu 130 135 140

Lys Ser 145

<210> 4

<211> 144

<212> PRT

<213> Taro bacilliform virus

<400> 4

Met Ser Val Pro Asn Ser Thr Tyr Pro Gly Tyr Ile Lys Ser Leu Glu 1 5 10 15

Glu Thr Lys Val Leu Gly Asp Pro Ser Val Gly Phe Ser Glu Ile Pro

Thr Thr Ala Ile Gly Thr Ala Thr Gly Phe Ser Thr Leu Tyr Lys Gln
45

Asn Asn Thr Ile Ile Asn Leu Leu Ile Ser Leu His Lys Lys Val Asp 50 55 60

Ser Leu Ser Lys Lys Thr Asp Val Asp Glu Leu Ala Thr Glu Leu Ser 65 70 75 80

Lys Leu Thr Ile Lys Asp Thr Pro Lys Val Lys Ala Lys Thr Pro Leu
85 90 95

Tyr Val Phe Lys Ser Pro Arg Leu Ile Leu Glu Glu Glu Arg Tyr Lys 100 105 110

Ile Gly Leu Pro Pro Thr Thr Thr Asp Trp Thr Trp Pro Val Gly His
115 120 125

Pro Phe Ala Pro Pro Pro Lys Thr Ser Thr Lys Ala Ser Thr Ser Ser 130 135 140 <210> 5

<211> 1881

<212> PRT

<213> Taro bacilliform virus

<400> 5

Met Ser Leu Ala Val Arg Asp Arg Gly Ser Asn Pro Ser Thr Ser Ser  $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$ 

Thr Val Pro Ser Gln Gln Asp Gln Ile Arg Asp Tyr Arg Asn Met Gln 20 25 30

Arg Val Arg His Thr Ala Glu Arg Ala Ala Arg Arg Ile Phe Pro Gly  $35 \hspace{1cm} 40 \hspace{1cm} 45$ 

Arg Phe Asn Arg Thr Leu Glu Ser Gln Ile Asn Pro Glu Ala Glu Ile 50 55 60

Arg Leu Ser Gln Gln Arg Arg Ala Ala Met Val Pro Ala Glu Val Leu 65 70 75 80

Tyr Asn Thr Ser Pro Ser Thr Arg Asn Gln Lys Val Tyr Gln His Tyr 85 90 95

Ser Glu Glu Arg Ile Leu Cys Thr Gly Gln Asn Gln Gln Leu Asn Leu 100 105 110

Pro Phe Ile Asn Glu Ser Ser Tyr Arg Ala Leu Arg Glu Ser Gly Gln 115 120 125

Gln His Leu His Ile Gly Leu Ile Met Ile Arg Val His Pro Leu His 130 135 140

Arg Arg Asn Ala Gly Thr Thr Ala Leu Ile Val Pro Arg Asp Ile Arg 145 150 155 160

Trp Asn Asp Asp Arg Ser Ile Ile Gly Thr Met Glu Ile Asp Leu Ser 165 170 175

Ala Gly Ser Gln Ile Val Tyr Ile Ala Pro Asn Ile Met Leu Ser Val 180 185 190

Glu Asp Phe Tyr Arg Asn Ile Gln Leu Ala Ile Gln Thr Gln Gly Tyr 195 200 205

Glu Asn Trp Asn Ser Ala Glu Ser Asn Leu Leu Ile Ser Arg Ala Leu 210 215 220

Ile Gly Arg Leu Thr Asn Asp Ser Phe Thr Gly Phe Gln Tyr Asn Ile 225 230 235 240

Ser Asn Val Ala Glu Tyr Leu His Ser His Gly Val Gln Ala Ile Glu 245 250 255

Gly Gln Ala His Pro Arg Thr Leu Gly Asn Arg Trp Ile Leu Gln Ala 260 265 270

| Pro        | Ala        | 275        | Pro        | Arg        | Ser        | ьeu        | 280        | Pro        | GIN        | ASII       | vaı        | 285        | Inr        | Inr        | Inr        |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Leu        | Leu<br>290 | Asp        | Gly        | Asn        | Val        | Ser<br>295 | Ile        | Arg        | Phe        | Ser        | Asn<br>300 | Tyr        | His        | Gln        | Ala        |
| Pro<br>305 | Val        | Asn        | Asp        | Thr        | Gln<br>310 | Asp        | Asn        | Ser        | His        | Pro<br>315 | Asp        | Ile        | Gln        | Glu        | Asp<br>320 |
| Glu        | Asn        | Gln        | Phe        | Ile<br>325 | Gly        | Phe        | Leu        | Ser        | Asp<br>330 | Leu        | Gly        | Glu        | Glu        | Tyr<br>335 | Glu        |
| Leu        | Glu        | Tyr        | Pro<br>340 | Ser        | Phe        | Thr        | Pro        | Val<br>345 | His        | Ala        | Asp        | Glu        | Phe<br>350 | Ile        | Phe        |
| Ile        | Ile        | 11e<br>355 | Asn        | Gly        | Glu        | Glu        | 11e<br>360 | Pro        | Asp        | Asp        | Phe        | Val<br>365 | Ser        | Ser        | Phe        |
|            | 370        |            |            |            |            | 375        |            | Ile        |            |            | 380        |            |            |            |            |
| 385        |            |            |            |            | 390        |            |            | Glu        |            | 395        |            |            |            |            | 400        |
|            |            |            |            | 405        |            |            |            | Lys        | 410        |            |            |            |            | 415        |            |
|            |            |            | 420        |            |            |            |            | Glu<br>425 |            |            |            |            | 430        |            |            |
| _          |            | 435        |            |            |            |            | 440        |            |            |            |            | 445        |            |            |            |
|            | 450        |            |            |            |            | 455        |            | Ala        |            |            | 460        |            |            |            |            |
| 465        |            |            |            |            | 470        |            |            | Gln        |            | 475        |            |            |            |            | 480        |
|            |            | _          |            | 485        |            |            |            | Asp        | 490        |            |            |            |            | 495        |            |
|            |            |            | 500        |            |            |            |            | Lys<br>505 |            |            |            |            | 510        |            |            |
| _          |            | 515        |            |            |            |            | 520        | Leu        |            |            |            | 525        |            |            |            |
|            | 530        |            |            |            |            | 535        |            | Val        |            |            | 540        |            |            |            |            |
| 545        |            |            |            |            | 550        |            |            | Leu        |            | 555        |            |            |            |            | 560        |
| rne        | ьeu        | ьeu        | GIN        | Asp<br>565 |            | ıyr        | GIN        | Gly        | 570        |            | AIā        | GIU        | GIN        | 575        | GIII       |

Ala Tyr Asn Asp Leu Glu Arg Ile Ser Cys Asp Asn Ile Lys Asp Leu 585 Ile Pro Tyr Leu Ile Gln Phe Arg Asn Leu Ala Ala Lys Ser Gly Arg Leu Phe Leu Gly Pro Glu Leu Ser Glu Lys Leu Phe Arg Lys Met Pro 610 615 Pro Leu Ile Gly Lys Glu Ile Glu Thr Ala Phe Ile Ala Lys His Gly Asn Ala Asn Ile Thr Val Met Pro Arg Ile His Phe Ala Tyr His Tyr Leu Ala Glu Leu Cys Lys Lys Ala Ala Leu Gln Arg Ser Leu Lys Asp Leu Ser Phe Cys Asn Gln Ile Pro Leu Pro Gly Ile Tyr Thr Lys Gly 680 Asn Lys Lys Phe Gly Leu Arg Lys Ala Arg Thr Tyr Lys Gly Lys Pro His Pro Thr His Val Arg Val Phe Lys Lys Ala Lys Tyr Gln Arg Thr Lys Lys Cys Lys Cys Phe Ile Cys Gly Glu Pro Gly His Phe Ala Arg 725 Glu Cys Thr Lys Gln Arg Gly Asn Ile Val Arg Ala Thr Val His Gln Glu Leu Ala Ile Pro Asp Asn Phe Asp Val Val Ser Val Asp Ala Asp 760 Glu Ser Asp Ser Ser Gly Ile Tyr Ser Tyr Ser Glu Asn Glu Ala Pro 775 Leu Gln Glu Val Asn Ser Phe Ile His Asp Glu Asn Ile Phe Phe Leu Ser Asp Ala Asp Glu Phe Glu Ser Pro Gln Gln His Leu His Glu Thr Val Asn Met Leu Gln Ser Arg Ser Ala Tyr Leu Pro Gln Val Ala Val 825 Gly Glu Glu Lys Leu Asn Cys Ser His Ile Trp Leu Gln Asp Val Asp Ile Pro Ser Asp Lys His Lys Cys His Thr Cys Arg Arg Asp Thr Gln 855 Lys His Tyr Arg Leu Glu Cys Gln Lys Cys Lys Phe Leu Val Cys Ser 870

Leu Cys Thr Ile Pro Tyr Leu Gly Ile Thr Met Gln Phe Arg Gln Lys 885 890 895

Gln Lys Ser Gln Pro Glu Asn Pro Asn Leu Val Arg Glu Leu Leu Glu 900 905 910

His Ala Ile Phe Leu Glu Glu Lys Cys Lys Asn Gln Glu Leu Leu Ser 915 920 925

Glu Thr Gln Ile Glu Arg Ile Val Ser Ser Glu Lys Gln Val Lys Phe 930 935 940

Tyr Gly Ile Leu Pro Thr Lys Lys Ser Asn Lys Ser Ala Gly Tyr Asp 945 950 955 960

Leu Gln Ser Asn Ile Asp Ile Glu Ile Pro Pro Gly Lys Cys Thr Val 965 970 975

Ile Ser Thr Gly Thr Phe Leu Gln Met Pro Asp Asn Met Tyr Gly Arg 980 985 990

Leu Val Glu Arg Thr Ser Leu Ala Ile Gln Gly Ile Thr Val Gln Gly 995 1000 1005

Gly Val Ile Asp Pro Asp Phe Thr Gly Glu Ile Gln Ile Val Leu Phe 1010 1015 1020

Asn His Asn Thr Ala Pro Tyr Pro Val Lys Lys Thr Tyr Arg Leu Ala 1025 1030 1035 1040

Gln Ile Ile Phe Glu Lys Phe Tyr Thr Pro Ile Phe Ile Gln Glu Pro 1045 1050 1055

Phe Thr Ser Thr Gln Gln Gly Ser Ser Asn Phe Gly Ser Thr Ala Lys 1060 1065 1070

Pro Leu Gln Ile Thr Glu Asn Ile Glu Val Met Ser Glu Thr Val Ala 1075 1080 1085

Asn Gln Val Ala Lys Ser Ser Val Leu Pro Arg Leu Tyr Ser Ile Gln 1090 1095 1100

Ala His Ile His Ile Ala Pro Asp Ile Val Ile Ser Thr Thr Ala Ile 1105 1110 1115 1120

Ile Asp Thr Gly Ala Thr Val Cys Cys Ile Ser Glu Lys Ile Val Pro \$1125\$ \$1130\$ \$1135

Glu Ala Ala Lys Glu Gln Leu Asn Tyr Lys Val Asn Ile Ser Gly Ile 1140 1145 1150

Ser Ser Gln Gln Gln Ile Gln His Arg Leu Lys Arg Gly Thr Leu Glu 1155 1160 1165

Ile Ala Ser Asn Lys Tyr Ala Leu Pro Leu Cys Tyr Ile Ile Glu Leu 1170 1175 1180

- Asn Asp Lys Asp Phe Ser Met Ile Leu Gly Cys Asn Phe Phe Lys 1185 1190 1195 1200
- His Met Gly Gly Met Arg Phe Glu Gly Pro His Val Thr Phe Tyr 1205 1210 1215
- Lys Gly Ile Thr Thr Leu Ser Thr Ser Tyr Ala Asn Thr Gly Ile Asp 1220 1225 1230
- Thr Glu His Glu Gln Ile Thr Ser Thr Thr Ser Gln Ser Phe Lys Glu 1235 1240 1245
- Arg Phe Ser Pro Leu Met Asn Glu Leu Lys Ala Ala Gly Tyr Ile Gly 1250 1255 1260
- Glu Asp Pro Leu Lys His Trp Ser Lys Asn Lys Val Thr Cys Lys Leu 1265 1270 1275 1280
- Asp Leu Lys Asn Thr Glu Ile Thr Ile Gln Asp Lys Pro Leu Arg His 1285 1290 1295
- Ile Thr Pro Ala Leu Glu Gln Ser Tyr Gly Arg His Val Asn Ala Leu 1300 1305 1310
- Leu Met Leu Lys Val Ile Gln Pro Ser Lys Ser Arg His Arg Thr Met 1315 1320 1325
- Ala Phe Leu Val Asn Ser Gly Thr Thr Val Thr Ala Asp Gly Lys Glu 1330 1340
- Ile Lys Gly Lys Glu Arg Met Val Phe Asn Tyr Lys Ala Leu Asn Asp 1345 1350 1355 1360
- Asn Thr Tyr Lys Asp Gln Tyr Ser Leu Pro Asn Ile Gln Leu Ile Leu 1365 1370 1375
- Lys Lys Val Ile Asn Ser Thr Ile Tyr Ser Lys Phe Asp Leu Lys Ser 1380 1385 1390
- Gly Phe His Gln Val Ala Met Asp Pro Asp Ser Val Glu Trp Thr Ala 1395 1400 1405
- Phe Leu Val Pro Gln Gly Leu Tyr Glu Trp Leu Ala Met Pro Phe Gly 1410 1415 1420
- Leu Lys Asn Ala Pro Ala Val Phe Gln Arg Lys Met Asp Ala Val Phe 1425 1430 1435 1440
- Lys Gly Cys Glu Lys Phe Leu Ala Val Tyr Ile Asp Asp Ile Leu Val \$1445\$ \$1450\$ \$1455
- Phe Ser Asn Asn Glu Glu Asp His Ala Lys His Leu Val Ile Met Leu 1460 1465 1470
- Gln Arg Cys Lys Glu His Gly Leu Val Leu Ser Pro Thr Lys Met Asn 1475 1480 1485

- Ile Ala Val Arg Glu Val Asn Phe Leu Gly Ala Thr Ile Gly Ser Arg 1490 1495 1500
- Lys Val Lys Leu Gln Glu Asn Ile Ile Lys Lys Ile Leu Asp Phe Asp 1505 1510 1515 1520
- Thr Glu Lys Leu Gln Ser Lys Lys Gly Leu Arg Ser Phe Leu Gly Ile 1525 1530 1535
- Leu Asn Tyr Ala Arg Asn His Ile Pro Asn Leu Gly Lys Ile Ala Gly
  1540 1550
- Pro Leu Tyr Ser Lys Thr Ser Ile Tyr Gly Asp Ile Arg Phe Ser Ala 1555 1560 1565
- Ser Asp Trp Lys Leu Ile Asn Glu Ile Lys Ala Ile Val Glu Lys Leu 1570 1580
- Pro Pro Leu Asp Tyr Pro Pro Glu Gln Ala Tyr Ile Ile Ile Glu Ser 1585 1590 1595 1600
- Asp Gly Cys Met Glu Gly Trp Gly Ala Ile Cys Lys Trp Lys Leu Ala 1605 1610 1615
- Glu Tyr Asp Pro Lys Ser Ser Glu Gln Ile Cys Ala Tyr Ala Ser Gly 1620 1625 1630
- Lys Phe Ser Pro Ile Lys Ser Thr Ile Asp Ala Glu Ile Thr Ala Ala 1635 1640 1645
- Met Glu Gly Leu Glu Ala Phe Lys Ile His Tyr Leu Asp Lys Gln Lys 1650 1660
- Ile Thr Leu Arg Thr Asp Cys Gln Ala Ile Ile Ser Phe Cys Asn Lys 1665 1670 1675 1680
- Thr Ser Val Asn Lys Pro Ser Arg Val Arg Trp Leu Lys Phe Ile Asp 1685 1690 1695
- Tyr Ile Thr Asn Thr Gly Ile Asp Val Lys Phe Glu His Ile Asp Ala 1700 1705 1710
- Lys Asn Asn Val Leu Ala Asp Thr Leu Ser Arg Leu Val Asn Thr Leu 1715 1720 1725
- Gln Asp Leu Pro Trp Leu Asp Glu Pro His Gln Asp Gln Thr Val Ser 1730 1735 1740
- Leu Met Gln Glu Ile Glu Asp Ala Pro Leu Glu Ile Lys Gln Arg Ser 1745 1750 1755 1760
- Leu Thr Cys Leu Gln Arg Leu Ile Cys Arg Ser Phe Met Glu Asp Ser 1765 1770 1775
- Thr Glu Glu Ala Ile His Phe Leu Glu Asp Asp Lys Ile Glu Pro Thr 1780 1785 1790

Ala Glu Ser Ser Thr Pro Ile Thr Leu Asp Glu Phe Ser Arg Lys Arg 1795 1800 Phe Gln Glu His Thr Asp Leu Leu Glu Glu Phe Gln Leu Thr Leu Leu 1815 1820 Gln Ile Asn Leu Leu Glu Ala Ser Leu His Glu Arg Leu Met Lys Cys 1825 1830 Gln Ser Tyr Ala Thr Arg Asp Asn Phe Trp Gly Asp Trp Leu Pro Glu 1845 1850 Ala Arg Arg Asp Leu Leu Gln Ile Gln Leu Ala Lys Glu Ile Ile Glu 1870 1865 Lys Val Arg Glu Lys Leu His Ser Ile 1875 1880 <210> 6 <211> 1190 <212> DNA <213> Taro bacilliform virus <400> 6 qccttcacqq qttaqatqqt tgaagttcat tgattatatt actaacactg gaattgatgt 60 taaatttgaa catattgatg ctaaaaataa tgtcttagct gacactctgt ccaggttagt 120 taacactttg caggatttgc catggctaga tgaacctcat caggatcaaa cagtctccct 180 gatgcaggaa attgaagatg cacctcttga aatcaagcag cgttctttaa cctgcttaca 240 gagactgatc tgtagaagct tcatggaaga ttctacagaa gaagctattc acttcctcga 300 agatgataag atcgagccaa cagctgagtc atcaacccca attactttgg atgaattttc 360 aagaaaaaga ttccaagaac atacagatct cttagaagaa tttcaattaa ctttgcttca 420 aattaatctt cttgaagcat ctcttcatga acgattaatg aaatgccaaa gttatgcaac 480 gagagataat ttctggggag attggctgcc tgaagctcgc agagatcttt tgcaaattca 540 actagccaaa gaaatcatcg agaaggttcg tgaaaagctt cactctatct agataggatt 600 ctttqtqtqt qaqtqqcqca cttgcgcata atgtagtaag gaattattgt acttttacgc 660 tggacgccac taggctccat gctttctgta atgtcacatc acttttacga attgagcctc 720 ggggagccgt tcgtacaaag tagatgcttt tctagtcaca tctgactttt ctaaaagcag 780 atgccatcaa ctttattcga gttgagcctc ggggagccgc tcgtttaaag atgctctttt 840 gaaaatgaca gcgcgtggtg cgatgtcatt ctcacctttt ctttaatgcg tcggccaccg 900 actgcattat tqaqattctc ttatcccttt gccacctcat cggttgcatt attgggattt 960 cgtatcgagt cgagggacga ggcctccact actcctataa aaggacctca acccctcaga 1020 agaacggcaa gccggaaaca ccgaacttcc cattettete ttgagtettt cetttgaget 1080 tgagcttgtg tgtaatcttt catagtttct aagtctccga agaacgagca ccgtctcgtg 1140 1190 aaggagccga tccttttcca accacacttt ttctaccttg gtatcagagc <210> 7 <211> 598 <212> DNA <213> Taro bacilliform virus <400> 7 ataggattet tigtgtgtga gtggegeact tgegeataat gtagtaagga attattgtae 60 ttttacgctg gacgccacta ggctccatgc tttctgtaat gtcacatcac ttttacgaat 120 tgagcctcgg ggagccgttc gtacaaagta gatgcttttc tagtcacatc tgacttttct 180

aaaagcagat gccatcaact ttattcgagt tgagcctcgg ggagccgctc gtttaaagat 240 gctcttttga aaatgacagc gcgtggtgcg atgtcattct caccttttct ttaatgcgtc 300

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tgggatttcg tatcgagtcg agggacgagg cctccactac tcctataaaa ggacctcaac 420
ccctcagaag aacggcaagc cggaaacacc gaacttccca ttcttctctt gagtctttcc 480
tttgagcttg agcttgtgtg taatctttca tagtttctaa gtctccgaag aacgagcacc 540
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tgccatcaac tttattcgag ttgagcctcg gggagccgct cgtttaaaga tgctcttttg 180
aaaatgacag cgcgtggtgc gatgtcattc tcaccttttc tttaatgcgt cggccaccga 240
ctgcattatt gagattctct tatccctttg ccacctcatc ggttgcatta ttgggatttc 300
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qaacqqcaaq ccqqaaacac cqaacttccc attcttctct tgagtctttc ctttgagctt 420
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ccattcttct cttgagtctt tcctttgagc ttgagcttgt gtgtaatctt tcatagtttc 180
taagtctccg aagaacgagc accgtctcgt gaaggagccg atccttttcc aaccacactt 240
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| <210><211><212><213>      | 24   |    |
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| <210><211><211><212><213> | 20   |    |
| <220><br><223>            | Description of Artificial Sequence: Synthetic primer |    |
| <400><br>ctgca            | 19<br>gggac gccactaggc                               | 20 |
| <210><211><211><212><213> | 23   |    |
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| <400><br>ctgca            | ggcca cctcatcggt tgc                                 | 23 |
| <210><211><211><212><213> | 23   |    |
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|        | primer  |     |
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|        |   | 24  |
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|        | primer  |     |
| 400    |   |     |
| <400>  |   | 24  |
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|        |   |     |
| 210    | 24  |     |
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| <213>  | Artificial Sequence                           |     |
|        |   |     |
| <220>  |   |     |
| <223>  | Description of Artificial Sequence: Synthetic |     |
|        | primer  |     |
|        |   |     |
| <400>  |   | 0.1 |
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|        |   |     |
|        |   |     |
| <210>  |   |     |
| <211>  | 28  |     |
| <212>  |   |     |
| <213>  | Artificial Sequençe                           |     |
|        |   |     |
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| <223>  | Description of Artificial Sequence: Synthetic |     |
|        | primer  |     |
|        |   |     |
| <400>  |   |     |
| ggaag  | cttgc ggccgccgag aaggttcg                     | 28  |
|        |   |     |
|        |   |     |
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| <210><211><211><212><213> | 15  |    |
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| <210><211><211><212><213> | 12  |    |
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| <210><211><212><212><213> | 7   |    |
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